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United States  
Department of  
Agriculture

Prepared by:  
Cooperative State  
Research Service  
Science and  
Education

STA/STA

# Food and Agriculture Competitively Awarded Research Grants

Fiscal Year 1982

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FOOD AND AGRICULTURE  
COMPETITIVELY AWARDED  
RESEARCH GRANTS

Fiscal Year 1982

UNITED STATES  
DEPARTMENT OF  
AGRICULTURE

PREPARED BY:  
COOPERATIVE STATE  
RESEARCH SERVICE  
SCIENCE AND EDUCATION

NOVEMBER 1982



## FOREWORD

Our country has an excellent State-Federal agricultural and forestry research partnership that has helped produce an agricultural envied the world over. The capability of our agriculture--its capacity to produce, be efficient, expand to meet each new need--is at least partly the result of there being a strong, stable research system supporting agriculture. This system provides the continuing base of research for agriculture--the resources, the continuity, necessary for science and for scientific advance on the many fronts involved in modern-day agriculture.

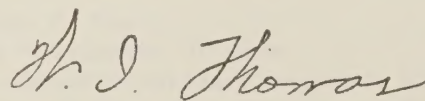
The research grants reported in this publication represent another aspect of this research system--the Competitive and Special research grants programs. Their focus is much on basic research--research to discover the knowledge needed before we can make further important and necessary breakthroughs in our applied research programs.

Qualified scientists both inside and outside the traditional agricultural research system are encouraged to apply for these grants. Thus not only scientists from the Federal laboratories, the State agricultural experiment stations, the schools of forestry, the 1890 universities and Tuskegee Institute, and the colleges of veterinary medicine, but scientists from all sorts of institutions and groups apply.

Most of the effort in these mission-oriented basic research programs is aimed at uncovering knowledge needed for further significant progress in the plant sciences--photosynthesis, biological nitrogen fixation, genetic mechanisms, and plant biological stress, for example. But other areas also are supported by grant programs such as those in animal health and aquaculture.

During the fiscal year October 1, 1981 to September 30, 1982, grants totalling \$26,610,010 were awarded to fund research projects at 104 institutions.

It is our strong belief that out of this combination of a sound, stable on-going research program, plus a sound competitive research grants program with which to tackle significant and puzzling problems in agricultural science, comes the information and knowledge necessary to keep our US agriculture strong and resilient--ready and able to meet any challenge that might be ahead.



WALTER I. THOMAS  
Administrator  
Cooperative State Research Service

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FOOD AND AGRICULTURE  
COMPETITIVELY AWARDED  
RESEARCH GRANTS

Fiscal Year 1982

THE GRANTS PROGRAM

The research grants programs of Science and Education that used the competitive process in the selection of grants during Fiscal Year 1982 were:

1. Competitive Research Grants Program to support basic research in the food and agricultural sciences;

2. Special Research Grants Program to support research deemed by the Congress and the Department of Agriculture to be of particular importance to the Nation; and

3. Alcohol and Industrial Hydrocarbons Research Grants Program.

These sources of funding supplement and complement funding of Federal agricultural research and the basic State research institution formula funding by Congress to help maintain a viable, effective on-going State-Federal agricultural research capability for this country.

All the grant funds are administered through the Cooperative State Research Service in S&E.

Guidelines for grants to be awarded competitively are published annually in the Federal Register, usually near the end of each calendar year. The guidelines identify selected research areas, the amount of funding, and the requirements for the submission of proposals.

Single copies or annual or semiannual subscriptions of the Federal Register are available for a small charge from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

If you want further information on program aspects of these grants, contact:

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Administrator  
Cooperative State Research Service  
U. S. Department of Agriculture  
Washington, D.C. 20250

If you want information on administrative aspects of these grants, contact:

Mr. Gene P. Spory  
Grants Management Officer  
Grants Administrative Management Office  
Science and Education Management Staff  
U. S. Department of Agriculture  
Suite 103, Rosslyn Commonwealth Building  
1300 Wilson Boulevard  
Arlington, Virginia 22209

## COMPETITIVE RESEARCH GRANTS PROGRAM

The grants awarded in this program concentrate in the plant biology and human nutrition areas. These two areas were selected because many scientific groups consider them to offer exceptional opportunity for fundamental scientific discovery. Research in these areas, in the long run, should contribute to applied research and development vitally needed for solving important food and nutrition problems. There is a need for innovative approaches and enhanced levels of funding to find ways to increase food production and improve human nutrition.

The following tabulation lists the funds awarded in the various areas in FY 1981 under the Competitive Research Grants Program.

Plant biology	\$13,036,800
Biological nitrogen	
fixation	\$2,910,000
Photosynthesis	\$2,910,000
Genetic mechanisms	
for crop improvement	\$3,821,800
Biological stress on	
plants	\$3,395,000
Human requirements for	
nutrients	<u>\$ 2,793,600</u>
TOTAL	<u>\$15,830,400</u>

This program is administered under the authority of Section 2(b) of P.L. 89-106, 7 U.S.C. 4501 as amended by Section 1414 of P.L. 95-113 and P.L. 92-224. It is open to qualified scientists in the United States. Scientists associated with the State agricultural experiment stations, all

U.S. colleges and universities, other research institutions and organizations, Federal agencies, private organizations or corporations, and individuals may submit proposals.

### Plant Biology

Grants were awarded in four areas of research in plant biology: Biological nitrogen fixation, photosynthesis, genetic mechanisms for crop improvement, and biological stress on plants. A brief description of each area of research follows with a listing of research grants made during FY 1981.

### Biological Nitrogen Fixation

Grants in this area support research to find ways to naturally increase the nitrogen available to plants. Lack of nitrogen for plant growth is the most common limiting factor in crop agriculture. This research will contribute to understanding nitrogen-fixing mechanisms in both symbiotic and free-living organisms, as well as the fate of fixed nitrogen.

The objective of this research is to build a foundation of basic information concerning nitrogen fixation. This information should help us enhance the process in currently known systems and provide a base for developing new nitrogen fixing associations--by genetic transfer or other means--for crop species not now possessing such capability.

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
University of Arizona Tucson, Arizona 85721	<sup>95</sup> Mo NMR As A Probe of Molybdenum Centers	John H. Enermark	\$60,000	09/01/81	08/31/83
University of California Davis, California 95616	Physiological Genetics of Denitrification: A Route to Conserving Fixed Nitrogen	John L Ingraham	\$56,000	07/01/81	06/30/83
University of California Davis, California 95616	Symbiotic Nitrogen Fixation and Delayed Leaf Senescence in Soybeans	Donald A. Phillips	\$10,000	08/28/78	02/28/83
University of Southern California Los Angeles, California 90087	Adenosine Triphosphate (ATP) Site of Nitrogenase	Charles E. McKenna	\$80,000	08/15/82	08/31/84
University of California Santa Cruz, California 95064	Regulation of <u>Rhizobium</u> - Legume Symbiotic Nitrogen Fixation	Robert A. Ludwig	\$100,000	08/01/80	07/31/84
University of Chicago Chicago, Illinois 60637	Nitrogen Fixation in Blue- Green Algae (Cyanobacteria)	Robert Haselkorn	\$140,000	08/01/82	07/31/84
North Central Region ARS, S&E, USDA 2000 West Pioneer Pkwy Peoria, Illinois 61614	Symbiotic N <sub>2</sub> Fixation by Soybean Mutants Defective in Nitrate Assimilation	James E. Harper	\$110,000	08/01/82	07/31/85



COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
North Central Region ARS, S&E, USDA 2000 West Pioneer Pkwy Peoria, Illinois 61615	Carbon Sources for Symbiotic Nitrogen Fixation of Forage Legumes	Gary H. Heichel	\$60,000	09/15/82	09/30/83
Iowa State Univ. of Science & Technology Ames, Iowa 50011	Gene Transfer and Mapping in <u>Rhizobium japonicum</u>	Alan G. Atherly	\$60,000	09/01/80	08/31/84
Kansas State University Manhattan, Kansas 66506	Recognition of Leguminous Hosts by a Promiscuous Rhizobium Strain	Peter P. Wong	\$95,000	08/01/82	07/31/84
Johns Hopkins University Baltimore, Maryland 21218	Factors Involved in and Regulation of Hydrogen Oxidation in <u>Rhizobium</u> <u>japonicum</u>	Robert J. Maier	\$110,000	07/15/80	07/31/84
Northeast Region ARS, S&E, USDA Rm 333, Bldg 003, BARC-W Beltsville, Maryland 20705	Enhancing N <sub>2</sub> Fixation in Soybean Germplasm Using the Ureide Analysis	P. B. Cregan	\$65,000	08/01/82	07/31/84
Massachusetts Institute of Technology Cambridge, Massachusetts 02139	Biochemical and Genetic Approaches to the Characterization of <u>nif</u> Gene Products	W. H. Orme-Johnson	\$85,000	08/01/81	07/31/83



COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Massachusetts Institute of Technology Cambridge, Massachusetts 02139	Genetics of Nodulation Specificity and Physiology in <u>Rhizobium</u>	Ethan R. Signer	\$75,000	09/01/80	08/31/84
University of Michigan Ann Arbor, Michigan 48109	4-Methyleneglutamic Acid/Amine Metabolism and Nitrogen Assimilation by Peanuts	Eugene E. Dekker	\$100,000	09/15/82	09/30/84
Michigan State University East Lansing, Michigan 48824	Nitrate Regulation of Recognition in the <u>Rhizobium</u> - Clover Symbiosis	Frank B. Dazzo	\$90,000	08/01/82	07/31/84
Michigan State University East Lansing, Michigan 48824	The Intracellular Organization of Ureid Synthesis in Soybean Nodules	Karel R. Schubert	\$80,000	09/01/82	08/31/84
University of Minnesota St. Paul, Minnesota 55104	Competitive Attributes of <u>Rhizobium japonicum</u> 123, A Successful Indigenous Strain	Edwin L. Schmidt	\$45,000	07/01/81	06/30/83
University of Minnesota St. Paul, Minnesota 55104	Structure-Function of Nitrogenase Fe-Protein: The ATP Site	James B. Howard	\$120,000	09/01/82	08/31/84
University of Minnesota St. Paul, Minnesota 55104	Components of Rates of Ammonium Oxidation in Soil	Jean-Alex E. Molina	\$60,000	09/15/82	09/30/84

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
University of Minnesota St. Paul, Minnesota 55104	Biochemistry of Nitrification: Nitrapyrin Inhibition and N-oxide Gas Production	Alan B. Hooper	\$100,000	09/01/82	08/31/84
Ag & For. Expt. Station Mississippi State Univ. Missi. State, Mississippi 39762	Selection and Evaluation of <u>Rhizobium</u> Specificity in Annual Clovers	Charles Hagedorn	\$65,000	09/15/82	09/30/84
University of Missouri Columbia, Missouri 65211	Nitrogen Metabolism and Nitrogen Fixation of <u>Rhodopseudomonas capsulata</u>	Judy D. Wall	\$80,000	08/01/82	07/31/84
University of Missouri Columbia, Missouri 65211	Nitrogen Fixation: Poly-B-hydroxybutyrate Metabolism and Energy Utilization	David W. Emerich	\$100,000	08/15/80	08/31/84
Rutgers--The State Univ. New Brunswick, New Jersey 08903	Improved Strains of Nitrogen-fixing Actinomycetes	Mary P. Lechevalier	\$55,000	08/01/80	07/31/84
Research Foundation of State Univ. of New York Albany, New York 12201	Molybdenum-Hydrazido- and Diazenido-Complexes; Structure, Reactivity, and Protic Degradation	Jon A. Zubieta	\$30,000	09/01/82	08/31/83

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Cornell University Ithaca, New York 14853	Ammonia Uptake and Retention by Photosynthetic Nitrogen Fixing Bacteria	Jane Gibson	\$44,000	09/01/82	08/31/84
Charles F. Kettering Research Lab 150 E. South College St. Yellow Springs, Ohio 45387	Nitrogenase Reactivity: Relevance to Molecular Mechanism and Cellular Physiology	Barbara K. Burgess	\$70,000	09/01/82	08/31/83
Charles F. Kettering Research Lab 150 E. South College St. Yellow Springs, Ohio 45387	Physiology and Control of Exopolysaccharide Synthesis in <u>Rhizobium</u> <u>japonicum</u>	Donald L. Keister	\$80,000	08/01/82	07/31/84
Charles F. Kettering Research Lab 150 E. South College St. Yellow Springs, Ohio 45387	Mechanisms by Which Soybean Plants Optimize Infection and Nodulation by Rhizobia	Wolfgang D. Bauer	\$95,000	08/01/82	07/31/84
Charles F. Kettering Research Lab 150 E. South College St. Yellow Springs, Ohio 45387	Mechanisms Involved in the Export and Import of $\text{NH}_4^+$ in <u>Rhizobium</u>	William R. Evans	\$75,000	08/15/82	08/31/84
Charles F. Kettering Research Lab 150 E. South College St. Yellow Springs, Ohio 45387	The Mechanism and Energetics of Biological Nitrogen Fixation	Gerald D. Watt	\$115,000	09/15/82	09/30/84

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Oregon State University Corvallis, Oregon 97331	Isolation and Transfer of Rhizobial Hydrogen Recycling Genes	Harold J. Evans	\$120,000	09/01/82	08/31/84
University of Virginia Charlottesville, Virginia 22906	Models for the Metal Cofactors of Nitrogenase: Potential Nitrogen Fixation Catalysts	Bruce A. Averill	\$105,000	09/01/82	08/31/84
Washington State Univ. Pullman, Washington 99164	Genetic Investigation of Gene Expression in <u>Rhizobium meliloti</u>	Michael L. Kahn	\$115,000	09/01/82	08/31/84
University of Wisconsin Madison, Wisconsin 53706	Nodulation by <u>Rhizobium</u>	Winston J. Brill	\$60,000	08/01/82	07/31/84

TOTAL: \$ 2,910,000



## Photosynthesis

Grants in this area focus on a better understanding of photosynthesis and associated carbon metabolism. Photosynthesis is the process whereby plants convert solar energy into chemical products that plants and animals use for growth and development. There are many indications that crop plant productivity can be raised by increasing photosynthetic efficiency.

The program's aim is to cover such areas as the mechanisms of energy capture and conversion, structure, synthesis, and turnover of the photosynthetic apparatus, CO<sub>2</sub> fixation, photorespiration, and dark respiration. Other areas included in this program are projects on the relation of plant development to photosynthesis, including development of photosynthetic competence, translocation and partitioning of photosynthetic products; and design of whole leaf and whole plant structures best suited for photosynthetic productivity. Another area set forth for proposals is that of the design of new methods of genetic and cellular manipulation to improve photosynthetic efficiency in plants--including studies of the chloroplast genome, of nuclear genes regulating photosynthesis, and analysis of regulatory steps controlling both nuclear and cytoplasmic genome expression and their interactions.

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL	AMOUNT	AGREEMENT PERIOD	
		INVESTIGATOR		FROM	TO
University of Arizona Tucson, Arizona 85721	Regulation of Photosynthetic CO <sub>2</sub> Assimilation in Wheat and Other Plants	Richard G. Jensen	\$91,000	07/15/82	07/31/84
University of California-San Diego La Jolla, California 92093	The Quinone-Iron Complex in Reaction Centers from Photosynthetic Bacteria	Melvin Y. Okamura	\$100,000	08/01/82	07/31/84
Western Region ARS, S&E, USDA 1333 Broadway, Suite 400 Oakland, California 94612	Control Mechanisms for Photosynthate Partitioning in Sugarbeet	Roger E. Wyse	\$86,000	09/01/82	08/31/84
University of Denver (Colorado Seminary) Denver, Colorado 80208	The Structure and Function of the Photosynthetic System of the Leaf	Steven P. Berg	\$90,000	09/01/82	08/31/84
Carnegie Institute of Washington 1530 P. St., N.W. Washington, D.C. 20005	Functional Diversity of Photosynthetic Mechanisms	Joseph A. Berry	\$82,900	09/15/82	09/30/84
Smithsonian Institution Arts & Industries Bldg. Rm 2203 Washington, D.C. 20560	Photosynthetic Accessory Pigments: Sites of Synthesis	Thomas E. Redlinger	\$47,200	08/01/82	07/31/83

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
University of Florida Gainesville, Florida 32611	Photosynthesis and Photorespiration in Algae and Higher Aquatic Plants	George E. Bowes	\$92,000	09/01/82	08/31/84
University of Illinois Urbana, Illinois 61801	Physiological and Biochemical Basis for Chilling-Impairment of Photosynthesis	Donald R. Ort	\$87,200	09/01/82	08/31/84
University of Illinois Urbana, Illinois 61801	Carbon Fixation Mutants of Higher Plants	William L. Ogren	\$92,000	08/15/82	08/31/84
University of Illinois Urbana, Illinois 61801	Electron and Proton Transfer in Photosynthesis: Limiting Reactions	C. John Whitmarsh	\$62,500	08/15/82	08/31/84
University of Illinois Urbana, Illinois 61820	Herbicide Action and Selectivity in Photosynthetic Electron Transport	Colin A. Wraight	\$50,000	09/15/81	09/30/83
Purdue Research Foundation West Lafayette, Indiana 47907	Mechanisms of Electron Transport in Photosynthesis	John L. Markley	\$50,000	08/15/82	08/31/83
Purdue Research Foundation West Lafayette, Indiana 47907	The Primary Structure of Cytochrome F and Other Photosynthetic Catalysts	Mark A. Hermodson	\$101,000	09/15/82	09/30/84

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
University of Kentucky Research Foundation Lexington, Kentucky 40506	Physiology of Photoacti- vation of Oxygen Evolution; Covalent Probes for the S-state Protein	George M. Cheniaie	\$100,000	08/01/82	07/31/84
Louisiana State Univ. & A&M College Baton Rouge, Louisiana 70803	Transport and Processing of Cytoplasmically Synthesized Chloroplast Proteins	Sue G. Bartlett	\$47,300	09/15/82	09/30/84
Amherst College Amherst, Massachusetts 01002	Temperature, Free Energy and Isotope Effects of Early Reactions in Photosynthesis	Robert E. Blankenship	\$95,800	08/01/80	07/31/84
Harvard College Cambridge, Massachusetts 02138	Genes for Photosynthesis in Corn	Lawrence Bogorad	\$50,000	08/15/82	08/31/83
University of Michigan Ann Arbor, Michigan 48109	The Role of Manganese in Photosynthetic Water Oxidation	Robert R. Sharp	\$81,000	08/15/82	08/31/84
University of Michigan Ann Arbor, Michigan 48109	Biochemistry of Photosynthetic Oxygen Evolution	Charles F. Yocum	\$86,000	09/15/82	09/30/84
Michigan State Univ. East Lansing, Michigan 48824	Charge Separation and Stabilization in Chloroplast Photosystem II	Gerald T. Babcock	\$58,000	08/01/81	07/31/83



COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL	AMOUNT	AGREEMENT PERIOD	
		INVESTIGATOR		FROM	TO
University of Minnesota St. Paul, Minnesota 55104	Photosynthate Transfer from Maternal to Embryonic Tissue in Soybeans	William A. Brun	\$82,400	09/15/82	09/30/84
University of Missouri Columbia, Missouri 65211	Cloning of Cyanobacterial Genes Coding for Photosyn- thetic Proteins	Louis A. Sherman	\$82,000	09/01/80	08/31/84
Agric. Expt. Station Univ. of Nebraska Lincoln, Nebraska 68583	Homogenous Pyruvate, Pi Dikinase from A C <sub>4</sub> Plant and Photosynthetic Bacterium	Raymond Chollet	\$100,000	09/15/82	09/30/84
Agric. Expt. Station Rutgers--The State Univ. New Brunswick, New Jersey 08903	Structure and Function of an Energy Transfer Pigment in Photosynthesis	Barbara A. Zilinskas	\$100,000	08/01/82	07/31/84
Cornell University Ithaca, New York 14853	The Role of Membrane Transport Systems in the Partitioning of Photosynthate	Roger M. Spanswick	\$50,000	09/01/81	08/31/83
Rockefeller University New York, New York 10021	Regulation of PEP Carboxylase Gene Expression	Nam-Hai Chua	\$50,000	09/01/81	08/31/83
University of Rochester Rochester, New York 14627	Ultrafast Electronic Processes in Chlorophyll- Proteins	Robert S. Knox	\$93,000	09/01/82	08/31/84

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Rensselaer Polytechnic Institute Troy, New York 12181	Synthesis and Assembly of Chloroplast Protein	Harry Roy	\$34,000	08/01/81	08/31/83
Ohio State University Research Foundation Columbus, Ohio 43212	Free-Energy Storage of Photosynthesis	Robert T. Ross	\$94,700	08/15/82	08/31/84
Oklahoma State University Stillwater, Oklahoma 74078	Electron Transfer in Photosynthetic Apparatus	Chang-An Yu	\$97,000	08/01/82	07/31/84
Oregon State University Corvallis, Oregon 97331	Definition of Chloroplast Membrane Proteins Essential for Photosystem II Function	Norman I. Bishop	\$79,000	08/15/82	08/31/84
Pennsylvania State University Univ. Park, Pennsylvania 16802	The Phycocyanin Genes of <u>Agmenellum quadruplicatum</u>	S. Edward Stevens	\$90,000	08/15/82	08/31/84
South Dakota State University Brookings, South Dakota 57007	Kinetics and <u>in vivo</u> Operation of Ribulose-1,5- Biophosphate Carboxylase/ Oxygenase	Christian Paech	\$89,000	08/15/82	08/31/84

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL	AMOUNT	AGREEMENT PERIOD	
		INVESTIGATOR		FROM	TO
U.S. Department of Energy Oak Ridge Operations Post Office Box E Oak Ridge, Tennessee 37830	Structural Studies on Ribulosebisphosphate Carboxylase/Oxygenase	Fred C. Hartman	\$100,000	09/15/82	09/30/84
University of Utah Salt Lake City, Utah 84112	Control of Assimilation and Water Loss in Canopies with Diaheliotropic Leaves	James R. Ehleringer	\$50,000	09/15/82	09/30/83
University of Wisconsin Madison, Wisconsin 53706	Regulation of Transport Systems in Plant Chloroplasts and Mitochondria	Earl Shrago	\$70,000	08/01/82	07/31/84
University of Wisconsin Madison, Wisconsin 53706	The Energy Coupling Apparatus of Wild-Type and Mutant <u>Chlamydomonas</u> <u>reinhardi</u>	Bruce R. Selman	\$50,000	09/01/82	08/31/83
Medical College of Wisconsin, Inc. Milwaukee, Wisconsin 53226	Mechanism of Activation of Ribulose Bisphosphate Carboxylase	Henry M. Mizioroko	\$49,000	09/01/81	08/31/83

TOTAL: \$ 2,910,000

## Genetic Mechanisms for Crop Improvement

Grants in this area are to encourage innovative or unique genetic approaches for the development of genetically superior varieties of agricultural crops. The desire is to obtain novel genetic combinations or gene modifications difficult or impossible to achieve using conventional plant-breeding techniques. Research areas are cell culture studies; development of cellular and molecular methods for identifying plant characteristics or genes that are significant targets for genetic manipulation; development of methods for producing, selecting, and transferring desired genetic traits; acquisition of basic information on nuclear and organelle plant gene expression and diversity at the molecular, cellular, or developmental level; and basic genetic studies on maintenance, alteration, and use of unadapted and wild germplasm.



COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
University of California Berkeley, California 94720	Developmental Regulation of Maize Gene Expression	William C. Taylor	\$83,000	09/01/82	08/31/84
University of California Davis, California 95616	Transfer of Quantitative Characters: Salt Tolerance from <u>Elytrigia</u> ( <u>Agropyron</u> ) to <u>Triticum</u>	Jan Dvorak	\$40,000	09/01/81	08/31/83
University of California Davis, California 95616	Increasing Expression of a Gram-positive Bacterial Gene After Transfer to Yeast	Sidney R. Snow	\$70,000	07/01/80	06/30/84
University of California-San Diego La Jolla, California 92093	Use of Plant Viruses to Introduce DNA Into Plants	Stephen H. Howell	\$50,000	09/01/81	08/31/83
University of California-San Diego La Jolla, California 92093	Cloning of Sequences Programming Meiosis in Normal and Mutant <u>Zea mays</u>	Herbert Stern	\$110,000	09/01/82	08/31/84
University of California-San Diego La Jolla, California 92093	Biosynthesis of the Major Lectin (phytohemagglutinin) in the Dry Bean ( <u>Phaseolus</u> <u>vulgaris</u> )	Maarten J. Chrispeels	\$82,000	09/01/82	08/31/84
University of California Los Angeles, California 90024	Regulation of Soybean Protein Gene Expression	Robert B. Goldberg	\$125,000	08/01/82	07/31/84

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
California Institute of Technology Pasadena, California 91125	New Methods for Molecular Cloning and Genetic Mapping of Plant Genes	Elliot M. Meyerowitz	\$100,000	09/01/82	08/31/84
Colorado State University Ft. Collins, Colorado 80523	Aneuploid Analysis of Genetic Architecture of Barley Chromosomes	Takumi Tsuchiya	\$80,000	08/01/82	07/31/85
Carnegie Institution of Washington 1530 P. St., N.W. Washington, D.C. 20005	The Molecular Biology of Controlling Elements in Maize	Nina V. Fedoroff	\$70,000	08/01/82	07/31/84
Carnegie Institution of Washington 1530 P. St., N.W. Washington, D.C. 20005	Regulation of Gene Expression by Phytochrome	W. F. Thompson	\$65,000	09/15/82	09/30/83
University of Florida Gainesville, Florida 32611	<u>In vitro</u> Genetic Variability and Selection in <u>Citrus</u> Species	Gloria A. Moore	\$75,000	07/15/82	07/31/85
University of Florida Gainesville, Florida 32611	Structure and Function of Sucrose Synthetase Genes in Maize	Prem S. Chourey	\$73,000	08/01/82	07/31/84
Florida State University Tallahassee, Florida 32306	Development of a Genetic Manipulation System for Cotton	Margaret Y. Menzel	\$40,000	09/15/81	09/30/83

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
University of South Florida Tampa, Florida 33620	Immunoassay as a Research Technique for New and Improved Lines of Citrus	Richard L. Mansell	\$60,000	09/15/80	09/30/84
University of Georgia Research Foundation, Inc. Athens, Georgia 30602	Interspecific Transfer of Genes for Obligate Apomixis from Wild <u>Pennisetum</u> to Pearl Millet	Wayne H. Hanna	\$90,000	09/15/82	09/30/85
University of Georgia Research Foundation Inc. Athens, Georgia 30602	Characterization of Genes Involved in the Formation of the C <sub>4</sub> Photosynthetic Apparatus	James R.Y. Rawson	\$100,000	09/01/80	08/31/84
North Central Region ARS, S&E, USDA 2000 W. Pioneer Parkway Peoria, Illinois 61614	Structural and Biochemical Changes During Wheat Development	Donald B. Bechtel	\$20,000	09/01/82	08/31/83
North Central Region ARS, S&E, USDA 2000 West Pioneer Pkwy Peoria, Illinois 61615	Introgression of Unadapted Germplasm for Broadening the U.S. Corn Germplasm Base	Arnel R. Hallauer	\$75,000	09/01/82	08/31/87
University of Illinois Urbana, Illinois 61801	Regulation of Gene Expression in the Aleurone Layers of Barley Seeds	Tuan-hua David Ho	\$75,000	08/01/82	07/31/84

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Indiana University Research Foundation Bloomington, Indiana 47402	Expression of Embryo- Specific Genes During <u>in</u> <u>vitro</u> Embryogenesis in <u>Brassica</u>	Martha L. Crouch	\$55,000	09/15/82	09/30/84
Indiana State University Terre Haute, Indiana 47809	Characterization of the Maize Genome: Cloning of Specific Maize Genes Into Yeast	John I. Stiles	\$70,000	09/01/82	08/31/84
Purdue Research Foundation West Lafayette, Indiana 47907	Chromatin Structure and T-DNA Transcription in Crown Gall Tumors	Stanton B. Gelvin	\$90,000	09/01/82	08/31/84
Purdue Research Foundation West Lafayette, Indiana 47907	Analysis of the Differen- tial Synthesis of Oat Storage Proteins	Brian A. Larkins	\$42,200	09/01/82	08/31/84
University of Iowa Iowa City, Iowa 52242	Analysis and Utilization of Genes Controlling Nondisjunction in the B Chromosome of Corn	Wayne R. Carlson	\$50,000	09/15/82	09/30/84
University of Kansas Lawrence, Kansas 66045	Citrus Isozymes for Breeding: Genetics, Linkage and Intracellular Localization	Andrew M. Torres	\$60,000	09/01/82	08/31/84

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL	AMOUNT	AGREEMENT PERIOD	
		INVESTIGATOR		FROM	TO
Kansas State University Manhattan, Kansas 66506	Wheat- <u>Agropyron</u> Hybrids: Cytogenetic Analysis of Genome in Polyploid <u>Agropyron</u> Species	Bikram S. Gill	\$125,000	08/01/82	07/31/85
University of Kentucky Research Foundation Lexington, Kentucky 40546	Wide Hybridization and Gene Transfer in <u>Nicotiana</u> and <u>Trifolium</u>	Glenn B. Collins	\$50,000	07/01/81	06/30/83
University of Massachusetts Amherst, Massachusetts 01003	The Role of Primary and Secondary Sex Traits in the Origin and Improvement of Maize	Walton C. Galinat	\$80,000	08/01/82	07/31/87
University of Minnesota St. Paul, Minnesota 55104	Tissue Culture Genetic Systems	Ronald L. Phillips	\$125,000	08/01/82	07/31/84
University of Minnesota St. Paul, Minnesota 55104	Transcriptional Studies in Zein Genes	Irwin Rubenstein	\$85,000	09/01/82	08/31/84
University of Minnesota St. Paul, Minnesota 55104	Structure, Transcription, and Replication of the Cauliflower Mosaic Virus Genome	Thomas J. Guilfoyle	\$110,000	09/01/82	08/31/84
University of Missouri Columbia, Missouri 65211	Genetic Control of Leaf Lesion Formation in Maize	M. G. Neuffer	\$60,000	09/01/82	08/31/85



COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL	AMOUNT	AGREEMENT PERIOD	
		INVESTIGATOR		FROM	TO
Agric. Expt. Station Univ. of Nebraska Lincoln, Nebraska 68588	Gene Locations for Wheat Economic Traits by Reciprocal Chromosome Substitution	M. Rosalind Morris	78,000	08/01/82	07/31/84
New Mexico State University Las Cruces, New Mexico 88003	Experimental Use of Isozymes in Applied Plant Genetics Research	Steven D. Tanksley	\$100,000	09/01/82	08/31/85
Research Foundation of State Univ. of New York Albany, New York 12201	Enzyme Basis for Herbicide (Glyphosate) Sensitivity and for Mutant Resistance	Roy A. Jensen	\$70,000	08/15/82	08/31/84
Cornell University Ithaca, New York 14853	Analysis of Organellar Genomes in Cybrid Brassica Tissue Obtained from Cell Fusion	Martha A. Mutschler	\$62,000	09/01/82	08/31/84
Brookhaven National Lab U.S. Department of Energy Upton, New York 11973	Genetic Instabilities in Crop Plants	Benjamin Burr	\$105,000	09/01/82	08/31/84
North Carolina State Univ. Raleigh, North Carolina 27650	Potential for Genetic Improvement in Nitrogen Use Efficiency in Maize	Robert H. Moll	\$85,000	09/01/82	08/31/85
North Carolina State Univ. Raleigh, North Carolina 27650	Structural Determinants of Differential Gene Expression in Maize	John C. Sorenson	\$10,600	09/15/81	06/30/83

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
North Carolina State Univ. Raleigh, North Carolina 27650	Plasmid-Like DNAs in Maize Mitochondria	Charles S. Levings	\$110,000	09/01/82	08/31/85
University of North Dakota Grand Forks, North Dakota 58202	Maize Plant Regeneration: The Role of Absciscic Acid	William F. Sheridan	\$48,000	08/01/82	07/31/84
Oregon State University Corvallis, Oregon 97331	Genetic Regulation of Hormonal Metabolism in Food Legumes	Donald J. Armstrong	\$110,000	09/15/82	09/30/84
University of Oregon Eugene, Oregon 97403	Differential Regulation of Genes of Carbon-fixing Enzymes in Maize Leaves	Donald R. Hague	\$80,000	07/01/80	06/30/84
Clemson University Clemson, South Carolina 29631	Cytogenetic Studies of Interspecific Hybrids of <u>Trifolium</u>	Earlene A. Rupert	\$55,000	09/01/82	08/31/84
Agric. Expt. Station Univ. of Tennessee Knoxville, Tennessee 37901	<u>In vitro</u> Culture of Cool Season Forage Grasses	Bob V. Conger	\$81,000	09/01/82	08/31/84
University of Tennessee Knoxville, Tennessee 37996	Characterization of Paraquat Resistant Mutants in Tobacco	Karen W. Hughes	\$30,000	08/28/79	08/31/83

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
University of Virginia Charlottesville, Virginia 22906	Increasing Genetic Resources for Tomato Breeding	Maureen R. Hanson	\$65,000	07/15/80	07/31/83
Washington State University Pullman, Washington 99164	Genetics of Nitrate Reduction in Barley	Andris Kleinhofs	\$82,000	09/01/82	08/31/84
University of Washington Seattle, Washington 98195	Incorporation and Expression of a Selectable Marker in Higher Plants	Eugene W. Nester	\$80,000	08/01/82	07/31/84
University of Wisconsin Madison, Wisconsin 53706	Genetic Analysis of Alfalfa Variants Regenerated from Cell Cultures	E. T. Bingham	\$40,000	07/01/81	06/30/83
University of Wisconsin Madison, Wisconsin 53706	Systems of Polygenic Control of a Metric Trait, Phaseolin Seed Protein	Fredrick A. Bliss	\$45,000	09/15/81	09/30/83

TOTAL: \$ 3,821,800

## Biological Stress on Plants

Research grants in this area support studies on stresses on plants arising from their interactions with other plants or with other biological agents such as weeds, insects, nematodes, fungi, bacteria, viruses, and mycoplasma-like organisms. The ultimate goal is to reduce losses in plant productivity from damage caused by biologically generated stresses.

Emphasis in this area is on studies that will enhance understanding of how stressful interactions are established between plants and other biological agents; how such interactions are influenced by environmental and other factors inherent to the interacting organisms; how the interactions reduce plant productivity and usefulness to man; how plants react to stress generated by such interactions; and how damage from such interactions may be reduced or eliminated.

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Auburn University Auburn Univ., Alabama 36849	Potential of Mycophagous Insects for Control of Plant Disease	E. A. Curl	\$50,000	09/15/82	09/30/84
Northern Arizona University Flagstaff, Arizona 86011	Competitive Effects of Selected Grasses and Forbs on Ponderosa Pine Seedlings	Alan S. White	\$33,000	09/01/82	12/31/84
University of California Berkeley, California 94720	Bark Beetles as Indicators of and Contributors to Stress in Ponderosa Pine	David L. Wood	\$83,000	08/01/82	07/31/85
University of California Berkeley, California 94720	Molecular Basis for Yield Loss in Plants Infected with Obligate Fungal Parasites	Bob B. Buchanan	\$55,000	09/01/82	08/31/84
University of California Davis, California 95616	Defining and Mapping the Genes of the Cauliflower Mosaic Virus	Robert J. Shepherd	\$40,000	08/01/81	07/31/83
University of California Davis, California 95616	Biochemical Facets of Resistance in Tomatoes Against Noctuid Larvae	Sean S. Duffey	\$65,000	08/01/82	07/31/84
University of California Davis, California 95616	Molecular Aspects of Disease Stress in Higher Plants	David G. Gilchrist	\$62,000	07/01/80	06/30/84



COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
University of California Davis, California 95616	Mechanisms Controlling Expression of Virulence in <u>Pseudomonas savastanoi</u>	Tsune Kosuge	\$41,000	07/01/81	06/30/83
University of California Davis, California 95616	Biochemistry of Small Pathogenic RNAs	George E. Bruening	\$75,000	09/15/82	09/30/84
University of California Davis, California 95616	Role of Environmental Stresses in the Development of Phytophthora Root Rot	John M. Duniway	\$90,000	07/01/80	08/31/84
University of California Davis, California 95616	Genetic Studies on the Host Range Genes of the pTi Plasmid	Clarence I. Kado	\$62,000	08/15/82	08/31/84
University of California Davis, California 95616	Development of Molecular Cloning Vectors for Investigating Fungal Sporulation	William E. Timberlake	\$70,000	09/01/82	08/31/84
University of California Los Angeles, California 90024	Role of Polygalacturonase in Elicitation of Stress Metabolites	Charles A. West	\$70,000	08/01/82	07/31/84
University of California Riverside, California 92521	Citrus Nematode: A Critical Stress Limiting Citrus Productivity	Carol J. Lovatt	\$60,000	09/01/82	08/31/84

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Howard University Washington, D.C. 20059	Chemistry and Function of the Opisthonotal Gland Secretions of Acarid Mites	Richard M. Duffield	\$70,000	07/01/80	08/31/84
University of Florida Gainesville, Florida 32611	Insect-Host Plant Inter- actions Affecting Pest Management	Simon S.J. Yu	\$70,000	09/01/82	08/31/84
University of Florida Gainesville, Florida 32611	Ratoon Stunting Disease: Host-Pathogen Interactions	Michael J. Davis	\$65,000	08/15/81	08/31/84
Loyola Univ. of Chicago Chicago, Illinois 60611	Crown Gall Control: Plasmid Engineering to Maximize Control and Minimize Failures	Stephen K. Farrand	\$25,000	08/15/82	08/31/83
North Central Region ARS, S&E, USDA 2000 West Pioneer Pkwy Peoria, Illinois 61615	Mechanisms of Race-specific Resistance in Plants	John P. Helgeson	\$75,000	09/01/82	08/31/84
North Central Region ARS, S&E, USDA 2000 West Pioneer Pkwy Peoria, Illinois 61615	Insect Control by Manipulation of Chitin Degrading Enzymes	Karl J. Kramer	\$90,000	09/15/82	09/30/84
University of Illinois Urbana, Illinois 61801	Population Dynamics of <u>Spiroplasma citri</u> as They Affect Plant and Insect Hosts	Jacqueline Fletcher	\$50,000	09/01/82	08/31/84

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
University of Illinois Urbana, Illinois 61801	Kairomones in Corn and Cucurbits in Monitoring and Controlling Corn Rootworms	Robert L. Metcalf	\$29,000	09/15/81	09/30/83
Kansas State University Manhattan, Kansas 66506	Modeling the Impact of Two Borer Species on Corn Physiology and Yield	Stephen M. Welch	\$35,000	09/15/82	09/30/83
University of Kentucky Research Foundation Lexington, Kentucky 40506	Characterization of dsRNA in Hypovirulent Strains of <u>Endothia parasitica</u>	Robert E. Rhoads	\$60,000	09/01/82	08/31/84
Southern Region ARS, S&E, USDA P.O. Box 53326 New Orleans, Louisiana 70153	Cultivar x Isolate Specificity in Polygenic Resistance: Environmental Interactions	Kurt J. Leonard	\$34,000	09/01/82	08/31/83
Northeast Region ARS, S&E, USDA BARC-W Beltsville, Maryland 20705	Cucumovirus Satellite- like RNA: Structure - Biological Function	Jacobus M. Kaper	\$45,000	09/15/82	09/30/83
University of Massachusetts Amherst, Massachusetts 01003	Host Selection Determinants in Apple Maggot and Mediterranean Fruit Flies	Ronald J. Prokopy	\$50,000	09/01/82	08/31/83

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
University of Massachusetts Amherst, Massachusetts 01003	Estimating Densities of Gypsy Moths with Pheromone Traps	Joseph S. Elkinton	\$60,000	09/01/82	08/31/84
Michigan State University East Lansing, Michigan 48824	Biotic and Abiotic Stress Interactions Between a Small Grain Crop and Insect Defoliator	Stuart H. Gage	\$65,000	09/01/80	08/31/84
University of Minnesota St. Paul, Minnesota 55104	Host Membrane Permeability in Powdery Mildew of Barley: Incompatible Interactions	Eduard J. Stadelmann	\$60,000	09/01/80	08/31/84
Ag & For. Expt. Station Mississippi State Univ. Missi. State, Mississippi 39762	Chemiluminescence by Soybean Root and Stem Cells	Marvin L. Salin	\$65,000	09/01/82	08/31/84
University of Missouri St. Louis, Missouri 63121	Stress Chemical Production in Pinewood Nematode Caused Pinewilt	Robert I. Bolla	\$50,000	09/01/82	02/28/85
Agric. Expt. Station Univ. of Nebraska Lincoln, Nebraska 68583	Mechanisms of Cultivar Resistance to Host- specific Fungal Pathotoxins	J. M. Daly	\$92,000	08/01/82	07/31/84

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Institute for Medical Research Copewood Street Camden, New Jersey 08103	Spiroplasma Plant Diseases: Role of Leafhopper Vectors	Gerard J. McGarrity	\$60,000	09/01/82	08/31/84
Boyce Thompson Inst. for Plant Research Cornell Univ. Tower Road Ithaca, New York 14853	An Enzyme Storage Complex for DNA Synthesis in Uredospores of the Bean Rust Fungus	Richard C. Staples	\$30,000	09/01/81	08/31/83
Cornell University Ithaca, New York 14853	The Importance of Phytoalexin Tolerance for Pathogenicity	H. D. VanEtten	\$75,000	08/01/80	07/31/84
Boyce Thompson Inst. for Plant Research Cornell Univ. Tower Road Ithaca, New York 14853	A Natural Egg-Laying Deterrent Regulating Insect Distribution on Plants	J. Alan Renwick	\$50,000	07/01/80	08/31/84
Cornell University Ithaca, New York 14853	Response of Alfalfa to Alfalfa Blotch Leafminer and Spring Black Stem	A. J. Sawyer	\$80,000	08/15/82	08/31/84
Cornell University Ithaca, New York 14853	An Efficient Gene-Cloning System for <u>Cochliobolus</u>	O. C. Yoder	\$70,000	09/15/82	09/30/84



COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Cornell University Ithaca, New York 14853	Plant Glandular Trichomes: A Mechanism for Combatting Insect Stress	Ward M. Tingey	\$82,000	09/15/82	09/30/84
Boyce Thompson Inst. for Plant Research Tower Road Ithaca, New York 14853	Colorado Potato Beetle Management Using an Entomopathogenic Fungus	Donald W. Roberts	\$70,000	10/01/80	09/30/84
Boyce Thompson Inst. for Plant Research Tower Road Cornell Univ. Ithaca, New York 14853	Plant Disease Process: Structure and Function of Host-specific Toxins	Vladimir Macko	\$60,000	09/01/82	08/31/84
Cornell University Ithaca, New York 14853	The Transfer of <u>Trichoderma</u> spp. From Treated Seeds to Seedling Roots and Soil	Gary E. Harman	\$55,000	09/15/82	09/30/84
North Carolina State University Raleigh, North Carolina 27650	Environmental and Host Interactions of an Entomogenous Fungus of Spider Mites	Wayne M. Brooks	\$50,000	09/01/82	08/31/84
North Dakota State University Fargo, North Dakota 58105	Stress From Foxtail in Various Small Grain Management Systems	John D. Nalewaja	\$55,000	08/15/82	03/31/85

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Ohio Agric. Research & Development Center Wooster, Ohio 46691	Evolution of Leafhoppers and Stunting Pathogens with Maize and its Ancestors	Lowell R. Nault	\$40,000	07/01/81	06/30/83
Oregon State University Corvallis, Oregon 97331	Role of an Integrative Plasmid in Virulence and Genetic Variation	Dallice I. Mills	\$65,000	07/15/80	07/31/84
Pennsylvania State Univ. Univ. Park, Pennsylvania 16802	Crop Response to Inter- acting Conditions of Water Stress and Insect Damage	Zane Smilowitz	\$50,000	09/01/82	08/31/84
Univ. of Rhode Island Kingston, Rhode Island 02881	Evaluating <u>Solanum</u> <u>berthaultii</u> for Colorado Potato Beetle Control	Richard A. Casagrande	\$35,000	08/15/82	10/31/84
Texas A&M Research Foundation College Station, Texas 77843	Mechanism of Stress Ethylene Induction in Cotton by the Fleahopper	Page W. Morgan	\$47,000	09/01/81	08/31/83
Texas A&M Research Foundation College Station, Texas 77843	Allomones Involved in the Parasite-Host Plant Interaction: A Model System	S. Bradleigh Vinson	\$50,000	08/01/81	07/31/83
Utah State University Logan, Utah 84322	Plant Pathogen Extra- cellular Polysaccharides: A Physical Model for Their Role in Virulence	Neal K. Van Alfen	\$60,000	09/15/82	09/30/84

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Virginia Polytechnic Inst. & State Univ. Blacksburg, Virginia 24061	Influence of Thistle Weevils in Pasture- Thistle Interaction	L. T. Kok	\$35,000	09/15/82	09/30/84
Washington State University Pullman, Washington 99164	Wound-Regulated Synthesis and Accumulation of Proteinase Inhibitors in Plants	Clarence A. Ryan	\$50,000	07/01/81	06/30/83
Washington State University Pullman, Washington 99164	Physiological and Chemical Changes in Lodgepole Pines Subjected to Stress From Bark Beetle Attack	Alan A. Berryman	\$60,000	08/15/82	08/31/84
University of Washington Seattle, Washington 98195	Mode of Action of the Phytotoxin Fusicoccin	Robert E. Cleland	\$75,000	09/01/80	08/31/84
University of Washington Seattle, Washington 98195	Molecular and Genetic Studies of <u>Agrobacterium</u> <u>tumefaciens</u> Attachment Mutants	Walter Halperin	\$55,000	09/15/82	09/30/84
University of Wisconsin Madison, Wisconsin 53706	Studies of the Structure of the Genetic Material of Plant Viruses	Paul J. Kaesberg	\$90,000	09/15/82	09/30/85

TOTAL: \$ 3,395,000

## Human Nutrition

The emphasis in this program is on determining human nutrient requirements. Support is not provided for clinical research or for demonstration or action projects.

Research in human nutrition contributes to improving human nutritional status by increasing our understanding of requirements for nutrients in relation to different patterns of food intake. Findings help fill the gaps of our knowledge related to nutrient requirements, bioavailability, the inter-relationships of nutrients, and the nutritional value of foods consumed in the United States as they relate to these requirements. Special attention in this program is given to the study of trace constituents of foods and their effect on human health.

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: HUMAN REQUIREMENTS FOR NUTRIENTS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
University of California Berkeley, California 94720	The Contribution of Cereal Foods to Meeting Human Needs for Niacin	Kenneth J. Carpenter	\$100,000	09/01/82	08/31/84
Western Region ARS, S&E, USDA 1333 Broadway, Suite 400 Oakland, California 94612	Use of Stable Isotopes to Determine Dietary Require- ments of Zinc, Copper, Iron, Calcium, and Magnesium	Judith R. Turnlund	\$120,000	09/15/82	09/30/84
Univ. of Colorado Health Science Center Denver, Colorado 80262	Zinc Requirements for Growth in Infants and Toddlers	K. Michael Hambidge	\$100,000	07/15/82	07/31/85
George Washington Univ. Washington, D.C. 20052	Dietary Fibers and Nutrient Absorption: Structure-Function Correlations	George V. Vahouny	\$100,000	08/01/82	07/31/83
George Washington Univ. Washington, D.C. 20052	Selenium Deficiency and Atherosclerosis. Abnormal Platelet Vascular Interactions	Robert W. Bryant	\$80,000	09/01/80	08/31/84
George Washington Univ. Washington, D.C. 20052	Dietary Fibers and Structural/Functional Correlations of Development in the Neonate Intestine	Marie M. Cassidy	\$140,000	08/01/82	07/31/84



COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: HUMAN REQUIREMENTS FOR NUTRIENTS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
University of Illinois Urbana, Illinois 61801	Effect of Riboflavin Deficiency on Maternal, Fetal and Neonatal Health	Robert A. Easter	\$100,000	09/15/82	09/30/84
Northeastern Region ARS, S&E, USDA BARC-W Beltsville, Maryland 20705	Assessing Zinc Status During Pregnancy	B. J. Apgar	\$35,000	09/15/82	09/30/83
University of Maryland College Park, Maryland 20742	Zinc, Selenium and Chromium Nutrition in Term and Pre-Term Infants	Glen E. Gordon	\$50,000	09/15/80	09/30/83
University of Massachusetts Amherst, Massachusetts 01003	Development of Complexes to Improve Iron Bioavailability in Plant Proteins and Cereals	Fergus M. Clydesdale	\$125,000	08/01/82	07/31/85
Massachusetts Institute of Technology Cambridge, Massachusetts 02139	Vitamin D Nutrition in Health and Disease	Michael F. Holick	\$200,000	08/01/82	07/31/84
Massachusetts Institute of Technology Cambridge, Massachusetts 02139	Biochemical Reasons for the Requirement of Vitamin A in the Mammalian Organism	George Wolf	\$80,000	09/01/81	08/31/83

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: HUMAN REQUIREMENTS FOR NUTRIENTS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Massachusetts Institute of Technology Cambridge, Massachusetts 02139	Biochemical Reasons for the Requirement of Vitamin A in the Mammalian Organism	George Wolf	\$4,000	09/01/81	08/31/83
Massachusetts Institute of Technology Cambridge, Massachusetts 02139	A Novel Approach for the Study of Human Amino Acid Metabolism in Relation to Dietary Requirements	Vernon R. Young	\$100,000	09/15/81	09/30/83
Michigan State University East Lansing, Michigan 48824	Metabolism and Function of Retinoic Acid in the Small Intestine	Maija H. Zile	\$10,000	07/15/82	07/31/83
St. Louis University St. Louis, Missouri 63103	Interrelationship of Iron and Vitamin E	Coy D. Fitch	\$60,000	09/15/82	09/30/83
Rutgers--The State Univ. New Brunswick, New Jersey 08903	Vitamin A Nutriture and One-Carbon Metabolism	Robert D. Steele	\$70,000	08/01/82	07/31/84
Cornell University Ithaca, New York 14853	Antithrombotic Action of n3 Polyunsaturated Acids: Optimum Intake and Effects on Prostaglandins	John E. Kinsella	\$75,000	07/15/82	07/31/83
Cornell University Ithaca, New York 14853	Effects of Proteins on Iron Bioavailability	Dennis D. Miller	\$80,000	07/15/82	07/31/85

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: HUMAN REQUIREMENTS FOR NUTRIENTS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Cornell University Ithaca, New York 14853	Metabolic Basis of the Lysine-sparing Action of Electrolytes	R. E. Austic	\$175,000	08/01/82	07/31/84
Cornell University Ithaca, New York 14853	Interrelationships of Cysteine, Vitamin B <sub>6</sub> , & Taurine Requirements During Development	Martha H. Stipanuk	\$109,600	09/15/82	09/30/85
St. Luke's - Roosevelt Institute for Health Sciences New York, New York 10025	Biochemical Assessment of Human Chromium Nutritional Status	F. Xavier Pi-Sunyer	\$200,000	09/01/80	08/31/84
Oklahoma Medical Research Foundation Oklahoma City, Oklahoma 73104	Dietary Requirements for Linoleic Acid and Antioxidant	Mary P. Carpenter	\$70,000	08/01/81	07/31/83
The Wistar Institute 36th & Spruce Sts. Philadelphia, Pennsylvania 19104	Influence of Different Peanut Oils on Atherosclerosis and Lipid Metabolism	David Kritchevsky	\$85,000	08/01/82	07/31/85
University of Texas Austin, Texas 78712	Manganese: Assessment of Requirements and Functions	J. H. Freeland-Graves	\$100,000	08/01/82	07/31/84
Utah State University Logan, Utah 84322	Pantothenic Acid Nutritional Status of Human Beings	Bonita W. Wyse	\$200,000	08/01/82	07/31/85

COMPETITIVE RESEARCH GRANTS PROGRAM  
PROGRAM AREA: HUMAN REQUIREMENTS FOR NUTRIENTS

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL	AMOUNT	AGREEMENT PERIOD	
		INVESTIGATOR		FROM	TO
Agric. Expt. Station Virginia Polytechnic Inst. & State Univ. Blacksburg, Virginia 24061	Role of Zinc in Parturition	George E. Bunce	\$125,000	08/01/82	07/31/85
Washington State Univ. Pullman, Washington 99164	Structural, Functional and Nutritional Roles of Insulin Potentiating Forms of Cr	John I. Legg	\$100,000	09/01/82	08/31/84

TOTAL: \$ 2,793,600

## SPECIAL RESEARCH GRANTS PROGRAM

The objective of this grant program is to carry out research to facilitate or expand promising breakthroughs in areas of food and agricultural sciences of importance to the Nation. Seven major areas of research were funded under this program during Fiscal Year 1982:

Soybean research	\$ 502,460
Antidesertification research	1,005,890
Animal health research	6,941,320
Aquaculture Research	502,460
Food quality and safety research	372,480
Energy research	931,200
Ethyl alcohol research	523,800
TOTAL	<u>\$10,779,610</u>

This program is administered under the authority of Section 2(c) (1) of P.L. 89-106, as amended by Section 1414 of P.L. 95-113. Eligible institutions include land-grant colleges and universities, State agricultural experiment stations, and all colleges and universities having demonstrable capacity in food and agricultural research.

A brief description of six of the seven areas of research in the Special Research Grants program follows with a listing of research grants made in each for 1982. Special Research Grants made for energy research are reported under "Alcohol and Industrial Hydrocarbons Research Grants Program."

## Soybean Research

The objective of this research is to increase soybean production and conserve natural resources. Two areas of research are funded under this topic: (1) Soybean production research to increase yields, enhance production efficiency, and conserve natural resources; and (2) research on soybean genetic mechanisms that contribute to yield or tolerance to biotic and abiotic stress.

Soybean acreage in the U.S. is exceeded only by corn. Farmers receive more dollars from soybean sales than any other crop, and the export of soybeans contributes more to the U.S. balance of trade than any other agricultural commodity. Edible soybean oil provides the raw material for a diversity of food and industrial uses. The high protein meal provides an indispensable feed for animals: two-thirds of all high-protein feed for livestock and poultry is soybean meal. This program of research grants is aimed at identifying factors limiting further production increases from this versatile crop. Once limiting factors are identified, techniques can be developed to alleviate the problem. Past increases in productivity have been significant--with an average per-acre per-year increase of 0.4 bushels over the past 30 years. The desire is to continue to increase the productivity of soybeans.



SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: SOYBEAN RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
University of Arkansas Fayetteville, Arkansas 72701	Genetics of Resistance in Soybeans to Variant Biotypes of Soybean-Cyst Nematode	C. E. Caviness	\$99,103	08/01/82	08/31/85
University of Georgia Research Foundation, Inc. Athens, Georgia 30602	Use of Canopy Photosynthesis in Soybean Yield Improvement	H. Roger Boerma	\$95,000	08/01/82	07/31/86
University of Illinois Urbana, Illinois 61801	Broadening the Genetic Base of the Soybean Through Utilization of Wild Species	Theodore Hymowitz	\$89,666	08/15/82	08/31/84
Iowa State University of Science & Techn. Ames, Iowa 50011	Improvement of Cultivated Soybeans by Utilization of the Wild Soybean <u>Glycine soja</u>	Walter R. Fehr	\$94,682	08/01/82	07/31/86
Agric. Expt. Station Univ. of New Hampshire Durham, New Hampshire 03824	Genetic Structure of Cultivated Soybeans and the Wild Soybean ( <u>Glycine soja</u> ) Germplasm	Yun-Tzu Kiang	\$94,680	08/01/82	07/31/85
Ohio Agric. Res. & Development Center Wooster, Ohio 44691	Role of Glyceollin in the Biochemical Mechanism of Root Tolerance to Phytophthora in Soybean	August F. Schmitthenner	\$29,329	09/15/82	09/30/83

TOTAL: \$ 502,460

## Antidesertification Research

The objectives of antidesertification research are to find more rapid, precise and economical methods of monitoring vegetation to detect trends in vegetation changes, and to find better and more economical methods of improving production from and conserving resources on land undergoing desertification.

One-third of the total land area of the world is arid, yet it is the homeland of 14 percent of the world's population. Inhabitants of these arid regions have modified the environment in various ways. Sometimes, the environmental modifications of these fragile lands, often in conjunction with drought, have resulted in a sustained decline and destruction of the biological productivity--a process termed desertification. Desertification has two components: a physical component related to recurring droughts which are a part of arid climates, and a social component related to population pressures and demands made on the land.

More economical and precise methods are needed for monitoring vegetation on these vast arid and semiarid landscapes. Better techniques are needed to more rapidly detect changes in the primary production (changes both in the total amount and in the relative proportion among species) so that remedial action can be taken at the first signs

of stress. Also, more information is needed on the behavior of arid plant ecosystems to better identify stress symptoms and more accurately predict the consequences of management alternatives.

Cost-effective methods of restoring the productivity of lands undergoing desertification are needed. This involves the spectrum of activities from the rehabilitation of disturbed land, to manipulation of the plant cover by management practices to enhance production and conserve resources.

SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: ANTIDESERTIFICATION RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM TO
University of Arizona Tucson, Arizona 85721	Monitoring Semiarid Range- lands by Satellite and Large Scale Aerial Photography	Charles F. Hutchinson	\$73,470	08/01/82 01/31/84
University of Arizona Tucson, Arizona 85721	Use of Remote Sensing to Quantify Soil Degradation in Desert Environments	Donald F. Post	\$14,000	08/15/82 02/28/84
University of Arizona Tucson, Arizona 85721	Water Harvesting Techniques for Reclamation of Lands Undergoing Desertification	G. R. Dutt	\$194,657	08/15/82 08/14/87
University of Arizona Tucson, Arizona 85721	Alternatives to Desertifi- cation in Arid Lands Agriculture	Kennith E. Foster	\$152,544	08/15/82 08/31/85
University of Nebraska Lincoln, Nebraska 68588	Federal Purchase/Management of Western Submarginal Lands--An Antidesertification Strategy	Mary-Louise Quinn	\$185,608	08/01/82 04/30/86
Agric. Expt. Station Univ. of Nevada Reno, Nevada 89512	Plant Succession Mechanisms for Improving Forage Productivity on Great Basin Rangelands	Paul T. Tueller	\$66,283	08/01/82 01/31/85

SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: ANTIDESERTIFICATION RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL	AMOUNT	AGREEMENT PERIOD	
		INVESTIGATOR		FROM	TO
New Mexico State Univ. Las Cruces, New Mexico 88003	Grazing as a Desertification Process in the Chihuahuan Desert	Reldon F. Beck	\$79,875	08/01/82	04/30/86
Texas A&M Research Foundation College Station, Texas 77843	Methodologies for Monitoring Grassland Vegetation Dynamics and Trends	Merwyn M. Kothmann	\$46,541	08/01/82	07/31/84
Texas A&M Research Foundation College Station, Texas 77843	A Systems Study of Desertification Process and Recovery Mechanisms	Peter J.H. Sharpe	\$192,912	08/01/82	09/30/85

TOTAL: \$ 1,005,890

## Animal Health

Overall, this research is to develop and/or refine abiotic and biotic methods to suppress animal losses from infectious and noninfectious diseases and internal and external parasites. The research is directed toward clarifying infectious and noninfectious diseases and parasites and their interactive effects on animal health; and to develop practical and implementable management systems for the producer to prevent or alleviate these causes of animal losses.

Research includes clarification of complex or unknown etiologies, development or improvement of diagnostic methodology, clarification of disease pathogenesis and methods of transmission, studies of resistance mechanisms and resistance enhancing factors and development of disease prevention, control or eradication technology.

Research is centered on highest priority animal health problems of beef and dairy cattle, swine, poultry, sheep, horses and aquaculture species as identified by the Animal Health Science Research Advisory Board. This includes studies on major causes of disease losses in beef and dairy cattle production such as the respiratory disease complex, reproductive diseases including brucellosis and anestrus, enteric and digestive diseases, mastitis, blue-tongue, parasites and metabolic diseases. Research on swine centers on health hazards such as enteric reproductive and respiratory diseases, parasites and bone diseases causing lameness. Poultry disease studies include respiratory diseases, skeletal problems, enteric disorders

and leukosis. Sheep research includes diseases such as foot rot, respiratory disease, parasites and blue tongue. Equine health research centers on respiratory disease, and musculoskeletal disorders. Research on diseases in aquaculture species also is included.



SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Auburn University Auburn Univ., Alabama 36849	Stress-Induced Endocrine Changes in the Pathogenesis of Bovine Respiratory Disease	Paul C. Smith	\$128,201	08/15/82	08/31/84
University of Alabama Birmingham, Alabama 35294	Sequence Variation and Antigenicity of Bluetongue Viruses. Virulence Characteristics of BTV Recombinants in Relation to Cattle Infection and Fetal Wastage	Polly Roy	\$130,847	09/15/82	09/30/84
University of Arizona Tucson, Arizona 85721	Pathogenesis of Swine Dysentery	Lynn A. Joens	\$80,000	09/01/82	08/31/85
University of California Davis, California 95616	The Role of Immunoglobulin E in Bovine Respiratory Disease	Laurel J. Gershwin	\$64,685	08/01/82	07/31/84
University of California Davis, California 95616	Field Tests of Efficacy and Specificity of New Coyote Management System	W. E. Howard	\$30,809	09/15/82	12/31/84
University of California Davis, California 95616	Rapid and Accurate Diagnosis of Mycoplasmosis of Chickens and Turkeys	Richard Yamamoto	\$70,902	09/15/82	09/30/85
University of California Davis, California 95616	Monoclonal Immunoenzymatic Detection and Identification of Bovine Mycoplasmas	Donald E. Jasper	\$88,000	09/15/82	03/31/84

SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
University of California Davis, California 95616	Virulence Determinants in <u>Pasteurella multocida</u> of Avian Origin	Dwight C. Hirsh	\$122,699	09/15/82	09/30/84
University of California Davis, California 95616	Local Immunity to Bovine Rotavirus Infection in Calves and Maternal Lymphocyte Traffic	Bennie I. Osburn	\$120,000	09/15/82	09/30/84
Colorado State University Ft. Collins, Colorado 80523	Virus Infections of Preimplantation Bovine Embryos	Richard A. Bowen	\$133,401	07/01/82	06/30/84
Colorado State University Ft. Collins, Colorado 80523	Antibiotic Induced Malabsorption in Calves	Robert W. Phillips	\$100,000	08/15/82	08/31/84
University of Delaware Newark, Delaware 19711	Characterization of Reoviruses Associated with an Apparent Malabsorption Syndrome in Chickens	John K. Rosenberger	\$100,000	09/15/82	09/30/85
University of Florida Gainesville, Florida 32611	The Cellular and Cell- Mediated Immune Response to Viruses of the Bovine Respiratory Tract	Michael J.P. Lawman	\$122,138	08/15/82	08/31/85
University of Florida Gainesville, Florida 32611	Pathogenesis of Osteochondrosis in Swine	James C. Woodard	\$63,500	09/15/82	09/30/85

SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
University of Georgia Research Foundation Athens, Georgia 30602	Recognition of Pathogenic Strains of <u>Aeromonas</u> and <u>Flexibacter</u>	Emmett B. Shotts	\$107,600	08/01/82	07/31/85
University of Illinois Urbana, Illinois 61801	Contribution of the Adrenal Gland to Anestrus in Suckled Beef Cattle	William C. Wagner	\$149,850	07/01/82	06/30/85
University of Illinois Urbana, Illinois 61801	Utilization of New Procedures for the Diagnosis of Osteochondrosis in Swine	Rodger V. Allhands	\$63,500	09/01/82	08/31/84
Purdue University West Lafayette, Indiana 47907	Blood Sucking Arthropods as Vectors of <u>Eperythrozoon suis</u> Splitter in Swine	Ralph E. Williams	\$50,000	09/01/82	08/31/85
Purdue University West Lafayette, Indiana 47907	Infectious Bronchitis in Chicks: Eye Adnexia in Pathogenesis and Immunity	Ronald L. Hullinger	\$71,998	09/15/82	09/30/84
Iowa State University of Science & Technology Ames, Iowa 50011	Cloning of Genes Coding for Infectious Bovine Rhino- tracheitis Virus Antigens	John E. Mayfield	\$98,835	09/01/82	08/31/85
Iowa State University of Science & Technology Ames, Iowa 50011	Inhibition and Potentiation of Neutrophil Function in Bovine Respiratory Disease	James A. Roth	\$144,555	08/01/82	07/31/85

SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Iowa State University of Science & Technology Ames, Iowa 50011	Pathogenesis of Respiratory Disease of Turkeys Caused by <u>Alcaligenes faecalis</u>	Lawrence H. Arp	\$81,335	08/15/82	08/31/85
Iowa State University of Science & Technology Ames, Iowa 50011	Relationship Between the SLA Gene Complex and Resistance to Atrophic Rhinitis	Max F. Rothschild	\$85,894	09/01/82	08/31/85
Iowa State University of Science & Technology Ames, Iowa 50011	Paratuberculosis: I. Development and Evaluation of An Enzyme Immunoassay	Charles O. Thoen	\$102,204	09/15/82	09/30/85
Iowa State University of Science & Technology Ames, Iowa 50011	Pathogenesis of Mycoplasmal Pneumonia of Swine	Richard F. Ross	\$146,811	09/01/82	08/31/85
Kansas State University Manhattan, Kansas 66506	Potential Control of Face Fly by Preventing Puparium Calcification	A. B. Broce	\$50,000	09/01/82	08/31/84
Agric. Expt. Station Univ. of Kentucky Lexington, Kentucky 40546	The Use of Anti-inflammatory Agents to Reduce Milk Loss During Mastitis	Robert J. Harmon	\$67,900	08/15/82	08/31/85
Agric. Expt. Station Univ. of Kentucky Lexington, Kentucky 40546	Epizootiology of Equine Herpesvirus Respiratory Infections	George P. Allen	\$127,240	09/15/82	09/30/85

SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Louisiana State University & A&M College Baton Rouge, Louisiana 70803	Development of an Efficacious Vaccine Against Avian Reovirus Infections	Wilfred T. Springer	\$120,209	08/15/82	08/31/85
Louisiana State University & A&M College Baton Rouge, Louisiana 70803	Development of a Vaccine Against <u>Strongylus vulgaris</u> in the Horse	Thomas R. Klei	\$87,260	09/01/82	08/31/85
University of Michigan Ann Arbor, Michigan 48109	Mechanism(s) of <u>Escherichia coli</u> Adhesion to Small Intestines	Richard E. Isaacson	\$100,000	09/15/82	09/30/85
Michigan State University East Lansing, Michigan 48824	Cortisol: Inhibitor of Normal Bovine Reproduction Postpartum	Edward M. Convey	\$97,048	09/01/82	08/31/84
Michigan State University East Lansing, Michigan 48824	Recombinant DNA and Chemically Synthesized Vaccines Against Marek's Disease	Leland F. Velicer	\$86,076	08/15/82	08/31/84
Michigan State University East Lansing, Michigan 48824	Pili Vaccines to <u>Salmonella</u> in Poultry	Robert J. Moon	\$72,100	09/01/81	09/30/84
University of Minnesota St. Paul, Minnesota 55104	Etiology of Swine Proliferative Enteritis	Gilbert E. Ward	\$78,738	08/15/82	08/31/84



SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
University of Missouri Columbia, Missouri 65211	<u>Fusobacterium necrophorum</u> Vaccination and Zinc for Control of Foot Rot in Sheep	John N. Berg	\$36,623	08/15/82	08/31/84
University of Missouri Columbia, Missouri 65211	Effects of Zearalenone on Estrus and Ovulation in Swine	Billy N. Day	\$94,155	08/15/82	08/31/84
University of Missouri Columbia, Missouri 65211	Swine Colibacillosis; Pharmacotherapy for the Heat-stable Toxin	Arnold A. White	\$100,000	09/15/82	09/30/84
Montana State University Bozeman, Montana 59717	<u>Trichinella spiralis</u> Infection of Wildlife and Its Relationship to Eradication of Trichinosis in Swine	David E. Worley	\$73,000	08/15/82	08/31/84
Agric. Expt. Station Univ. of Nebraska Lincoln, Nebraska 68583	Antigens of <u>Ascaris suum</u> Which Stimulate Antibody Production in Swine	Marvin B. Rhodes	\$67,900	09/01/82	08/31/85
Cornell University Ithaca, New York 14853	Brucellosis: Detection of Latent Infection and Distinction of Vaccination Reactions by KELA	Richard H. Jacobson	\$39,975	09/01/82	08/31/83

SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Cornell University Ithaca, New York 14853	Genetic Control of Immunity in Cattle	Douglas F. Antczak	\$138,710	09/01/82	08/31/85
Cornell University Ithaca, New York 14853	Effect of Calfhood Diarrhea and Pneumonia on First Lactation Productivity and Health	Hollis N. Erb	\$72,260	09/01/82	02/28/87
Cornell University Ithaca, New York 14853	The Molecular Biology of Virulence and Drug Resistance in Mastitis Pathogens	Gary M. Dunny	\$100,000	09/01/82	08/31/85
Cornell University Ithaca, New York 14853	Genetic Basis of Edema Disease Toxin Production by <u>E. coli</u> from Outbreaks of Edema Disease in Swine	John F. Timoney	\$43,062	09/15/82	09/30/83
Univ. of North Carolina Chapel Hill, North Carolina 27514	Expression of <u>Leptospira</u> <u>interrogans</u> Surface Proteins In <u>E. coli</u> K 12	Philip J. Bassford	\$136,040	09/01/82	08/31/84
North Carolina Agric. Research Service North Carolina State Univ. Raleigh, North Carolina 27650	Effect of Viral Respiratory Infections on Local Pulmonary Defense Mechanisms of Calves	Talmage T. Brown	\$115,534	08/15/82	08/31/85

SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
North Carolina Agric. Research Service North Carolina State Univ. Raleigh, North Carolina 27650	Endocrine Mechanisms Involved in Prolonged Anestrus After Weaning in Sows	Jack H. Britt	\$120,907	09/01/82	08/31/85
Ohio State University Research Foundation Columbus, Ohio 43212	Resistance of Exotic Breeds of Sheep to Chronic Fascioliasis	Charles H. Courtney	\$100,699	09/15/82	09/30/84
Ohio State University Research Foundation Columbus, Ohio 43212	Induced Parturition and Vitamin D in the Prevention of Mineral Imbalances in Cows	Charles C. Capen	\$40,000	09/15/82	09/30/83
Ohio Agric. Research & Development Center Wooster, Ohio 44691	Genetic and Pathogenesis of Leg Weakness in Turkeys	K. E. Nestor	\$133,981	08/15/82	08/31/85
Ohio Agric. Research & Development Center Wooster, Ohio 44691	Growth of Environmental Streptococci in Nonlactating Bovine Mammary Secretions	K. Larry Smith	\$45,712	09/01/82	08/31/83
Ohio Agric. Research & Development Center Wooster, Ohio 44691	Immunization of Cows with Rota-coronavirus Vaccines and Protection in Calves	Linda J. Saif	\$130,000	09/01/82	08/31/85

SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Ohio Agric. Research & Development Center Wooster, Ohio 44691	Defining the Role of Cryptosporidiosis in the Calf Enteric Disease Complex	Donald R. Redman	\$65,000	09/01/82	08/31/84
Univ. of Pennsylvania Phila., Pennsylvania 19104	Mineral Imbalance: Responses to Treatment with Active Metabolites of Vitamin D	Charles F. Ramberg	\$39,500	09/01/82	08/31/84
Univ. of Pennsylvania Phila., Pennsylvania 19104	Pseudorabies Virus: DNA Fingerprinting and New Approaches to Analyses of Latent Infections	William C. Lawrence	\$39,638	09/15/82	09/30/85
Pennsylvania State Univ. Univ. Park, Pennsylvania 16802	Functions of Mammary Gland Lymphocytes and Phagocytic Cells During the Dry Period	R. Wilson	\$75,000	09/15/82	09/30/84
Agric. Expt. Station South Dakota State Univ. Brookings, South Dakota 57007	Compounds Affecting Expression of K99 Adherence Pili on <u>Escherichia coli</u>	David H. Francis	\$22,596	08/15/82	08/31/84
Agric. Expt. Station South Dakota State Univ. Brookings, South Dakota 57007	Pathogenesis of Mixed Rotavirus-Escherichia coli Infections in Gnotobiotic Pigs	D. A. Benfield	\$80,000	09/01/82	08/31/84

SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of South Dakota Vermillion, South Dakota 57069	Host Immune Resistance to Ixodid Tick Infestation: An Alternative Method of Tick Control	Stephen K. Wikel	\$80,000	09/15/82	09/30/84
Agric. Expt. Station Univ. of Tennessee Knoxville, Tennessee 37901	Mechanisms of Bacterial Pathogenesis in Respiratory Disease of Swine	David Allen Bemis	\$85,895	09/01/82	08/31/85
Agric. Expt. Station Univ. of Tennessee Knoxville, Tennessee 37901	Development of Potential Enteric Coronavirus Vaccine Sources Using Recombinant DNA	David A. Brian	\$130,000	09/15/82	08/31/85
Agric. Expt. Station Univ. of Tennessee Knoxville, Tennessee 37916	Role of Bovine Virus Diarrhea Virus Vaccine Strains in Bovine Respiratory Tract Disease	Leon N.D. Potgieter	\$149,886	09/15/82	09/30/85
Texas A&M Res. Fdn. College Station, Texas 77843	Differentiation of <u>Burcella</u> <u>abortus</u> S19 and Field Strain Antigenic Determinants	L. Garry Adams	\$86,255	09/01/82	08/31/84
Texas A&M Res. Fdn. College Station, Texas 77843	Neuroendocrine Correlates of Anestrus in Cattle	Max S. Amoss	\$126,602	09/01/82	08/31/85



SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Agric. Expt. Station Texas A&M Univ. College Station, Texas 77843	Caseous Lymphadenitis in Small Ruminants	Charles W. Livingston	\$123,179	09/01/82	08/31/85
Univ. of Vermont & State Agric. College Burlington, Vermont 05405	Natural Antibodies, Complement and Conglutinins: Roles in Brucellosis Serology	David K. Boraker	\$106,855	09/01/82	08/31/84
Washington State University Pullman, Washington 99164	Endocrine Control of Cystic Ovaries in Dairy Cattle	Jerry J. Reeves	\$143,692	09/01/82	08/31/85
Washington State University Pullman, Washington 99164	Defense Mechanisms in Viral and Bacterial Infections of the Bovine Lung	H. D. Liggitt	\$134,802	08/15/82	08/31/84
Washington State University Pullman, Washington 99164	Protection of Sheep Against Haemonchosis by Prior Exposure to <u>Ostertagia circumcincta</u>	Richard B. Wescott	\$30,810	09/01/82	08/31/84
Washington State University Pullman, Washington 99164	Isolation of Protective Juvenile <u>Fasciola hepatica</u> Surface Antigens	R. Wesley Leid	\$80,000	09/01/82	08/31/84
Washington State University Pullman, Washington 99164	Mastitis and the Major Histocompatibility Gene Complex	William C. Davis	\$67,588	09/15/82	09/30/85

SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
University of Wisconsin Madison, Wisconsin 53706	Cellular Immunity to IBR and IPV Viruses	Gary A. Splitter	\$150,000	09/15/82	09/30/85
University of Wisconsin Madison, Wisconsin 53706	Ciliary Structure-Function and Diagnosis of Bovine Respiratory Disease	Norman J. Wilsman	\$50,000	09/01/82	08/31/85
University of Wisconsin Madison, Wisconsin 53706	3-Methylindole Lung Toxicity: Mechanisms of Disease and Prevention in Cattle and Goats	Gerald E. Bisgard	\$141,129	09/15/82	09/30/84

TOTAL: \$ 6,941,320

## Aquaculture

This research is to provide and/or improve upon the scientific and technical base needed by the aquaculture industry. This industry has been expanding rapidly. Problems of nutrition, breeding, physiology, management, disease and parasite control are important and are becoming more limiting as the size of the industry and its concentration have increased.

Interest focused on local and regional problems for which solutions will contribute to national objectives related to aquaculture production.

The specific objectives of the program are: (1) improved production efficiency in diet formulation, reproduction and breeding, disease and parasite control; (2) requirements for improved water quality for production and factors affecting the quality of water discharge; and (3) increased production of freshwater species having high production potential such as catfish, trout, bait minnows, and crawfish.

SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: AQUACULTURE RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Auburn University Auburn Univ., Alabama 36849	Water Movement and Oxygen- ation by Emergency Aeration Devices	Claude E. Boyd	\$18,860	08/01/82	07/31/84
Auburn University Auburn Univ., Alabama 36849	Absorption and Release of Off-flavor Compounds by Channel Catfish	Richard T Lovell	\$26,000	08/01/82	07/31/84
University of California Davis, California 95616	Maturation and Controlled Spawning of Channel Catfish, <u>Ictalurus punctatus</u>	Serge I. Doroshov	\$79,126	09/01/82	08/31/84
University of California Davis, California 95616	Development and Utilization of a Cell Line from White Sturgeon	Ronald P. Hedrick	\$28,216	09/01/82	08/31/84
University of Maryland College Park, Maryland 20742	Production of Monoclonal Antibodies to Viral Pathogens of Cultured Fish	Frank M. Hetrick	\$80,000	09/15/82	09/30/84
Univ. of Mississippi Medical Center 2500 N. State St. Jackson, Mississippi 39216	Immunodiagnostic and Prophylactic Procedures with Channel Catfish	Lester W. Clem	\$80,000	09/15/82	09/30/84

SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: AQUACULTURE RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Ag & For. Expt. Station Mississippi State Univ. Missi. State, Mississippi 39762	Rapid Identification of Channel Catfish Virus Carriers	John A. Boyle	\$71,443	09/15/82	09/30/84
Washington State University Pullman, Washington 99164	Induction of All-paternal Inheritance in Rainbow Trout	Gary H. Thorgaard	\$38,911	09/15/82	09/30/84
University of Washington Seattle, Washington 98195	Genotype-Environment Interactions in Rainbow Trout Production Traits	William K. Hershberger	\$79,904	09/15/82	09/30/84

TOTAL: \$ 502,460

## Food Quality And Safety

The objective of this research is to provide additional scientific and technical information needed to protect the quality, wholesomeness and safety of the food supply. A further goal is to provide scientific and technical information upon which to base action and regulatory agency decisions, standards, and regulations related to the safety and quality of food and to facilitate industry compliance with the regulations. Information generated will assist also in maintaining public confidence in the quality and safety of the food supply.

Specific concerns have arisen regarding potential hazards that may result from ingestion of foods containing minute amounts of nitrosamines. Meat products cured by use of nitrate and nitrite salts were of special interest since nitrosamines, in the parts per billion range, may be produced when bacon cured with nitrite is cooked to the well-done or crisp stage.

Specific areas of inquiry include: (1) study of the mode of action(s) of nitrites and how nitrosamines are formed chemically and how to detect them; (2) the interactions of nitrite, pH, salt content, other additives, heat and muscle type on residues and flavor; (3) development of suitable nitrite substitutes; and (4) identification of systems that inhibit nitrosamines in cured products.



SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: FOOD QUALITY AND SAFETY RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Iowa State University of Science & Technology Ames, Iowa 50011	Chemical Interactions of Sodium Nitrite and Salt (Sodium Chloride) in Cured Meat	Joseph G. Sebranek	\$51,000	09/15/82	09/30/84
Michigan State University East Lansing, Michigan 48824	Mechanisms and Precursors of N-Nitrosamine Formation in Cured Meats	James I. Gray	\$90,500	09/15/82	03/31/85
Rutgers--The State Univ. New Brunswick, New Jersey 08903	Mode of Action of Nitrite as a Microbial Inhibitor	Myron Solberg	\$90,500	09/15/82	09/30/84
Cornell University Ithaca, New York 14853	Process-induced Formation of Nitrate, Nitrite, and N-nitrosamines in Foods	Joseph H. Hotchkiss	\$60,000	09/15/82	09/30/85
Oregon State University Corvallis, Oregon 97331	N-Nitrosamines in Cured Meat Products	Richard A. Scanlan	\$80,480	09/15/82	09/30/85
TOTAL:			\$ 372,480		

ENERGY AND INDUSTRIAL HYDROCARBONS  
RESEARCH GRANTS PROGRAM

The emphasis in this research is on the production and use of renewable energy sources. The Cooperative State Research Service funds involve Ethyl Alcohol Research covering the evaluation, treatment, and conversion of biomass resources for manufacture of ethyl alcohol. Energy research grants (Special Research Grants Program), support research in the following four specific areas: combustion, pyrolysis, and gasification; and biomass storage; methanol production; and vegetable oil as diesel substitute.

The total funding available for these programs is \$1,455,000.

SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: ENERGY RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
California Polytechnic State University Fdn. San Luis Obispo, California 93407	Biomass Compaction	Edgar J. Carnegie	\$66,990	09/01/82	08/31/85
Colorado State University Ft. Collins, Colorado 80523	Storage and Preprocessing of Sweet Sorghum for Fermentation	Judson M. Harper	\$79,138	09/01/82	11/30/83
University of Idaho Moscow, Idaho 83843	Deterioration of Vegetable Oils by Oxidative and Thermal Polymerization	Roger A. Korus	\$79,820	09/15/82	09/30/85
Purdue Research Foundation West Lafayette, Indiana 47907	Biomass Storage Systems	Robert M. Peart	\$79,749	09/01/82	08/31/84
Purdue University West Lafayette, Indiana 47907	Methanol Production from Food and Agricultural Wastes	Martin R. Okos	\$79,352	09/01/82	08/31/84
Kansas State University Manhattan, Kansas 66506	Effects of Storage of Vegetable Oil-derived Diesel Fuels on Performance	William E. Klopfenstein	\$50,257	09/15/82	09/30/85
University of Kentucky Research Foundation Lexington, Kentucky 40506	Particulate Deposition When Passing Gasification- Combustion Gases Through Grain	Otto J. Loewer	\$80,000	09/01/82	08/31/85

SPECIAL RESEARCH GRANTS PROGRAM  
PROGRAM AREA: ENERGY RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
University of Kentucky Research Foundation Lexington, Kentucky 40506	Storage Characteristics and Drying Properties of Corn Cobs	S. G. McNeill	\$80,000	09/15/82	09/30/85
University of Maine Orono, Maine 04469	Storage of Particulate Woody Biomass Fuels	John G. Riley	\$61,675	09/15/82	09/30/84
University of Minnesota St. Paul, Minnesota 55104	Processing and Combustion of Corncores to Provide Heat for Drying Corn	R. Vance Morey	\$79,506	09/01/82	08/31/84
Ohio Agric. Research & Development Center Wooster, Ohio 44691	A Farmstead Energy Center: Based Upon Corncob Combustion and Cogeneration	Harold M. Keener	\$79,365	09/15/82	09/30/84
Clemson University Clemson, South Carolina 29631	Control Algorithm for Two- stage Combustors	Frederick A. Payne	\$45,864	09/01/82	08/31/84
Agric. Expt. Station Virginia Polytechnic Inst. & State Univ. Blacksburg, Virginia 24061	Long-term Storage of Whole Sweet Sorghum Stems for Processing to Ethanol	John S. Cundiff	\$69,484	09/01/82	06/30/84
TOTAL:			\$ 931,200		

ALCOHOLS AND INDUSTRIAL HYDROCARBONS PROGRAM  
PROGRAM AREA: ETHYL ALCOHOL RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1982

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Colorado State University Ft. Collins, Colorado 80523	A Freeze-Explosion Method for Increasing Cellulose Hydrolysis	Bruce E. Dale	\$79,083	08/15/82	08/31/84
Purdue University West Lafayette, Indiana 47907	Deep Bed Cornmeal Adsorber with Combined Adsorption/ Desorption Cycle	Michael R. Ladisch	\$80,000	09/01/80	08/31/84
Purdue University West Lafayette, Indiana 47907	Improvement of <u>Candida</u> sp. XF217 for Ethanol Production from Hemicellulose Carbohy- drates	Cheng Shung Gong	\$70,000	09/01/82	08/31/84
Worcester Polytec Inst. Worcester, Massachusetts 01609	Ethanol Conversion to Hydrocarbons in the Presence of Water by Zeolite Catalysis	William R. Moser	\$70,000	09/01/82	08/31/84
Agric. Expt. Station Univ. of Nebraska Lincoln, Nebraska 68583	Optimization of Corn and Whey Cofermentation	Khem M. Shahani	\$64,847	08/15/82	08/31/84
Agric. Expt. Station Rutgers--The State Univ. New Brunswick, New Jersey 08903	Enhancement of Substrate Utilization of Zymomonas	Douglas E. Eveleigh	\$79,980	08/15/82	08/31/84
Lehigh University Bethlehem, Pennsylvania 18015	Solid State Fermentation of Sweet Sorghum to Ethanol in a Rotary Drum Fermenter	Fikret Kargi	\$79,890	09/15/82	09/30/84

TOTAL:       \$ 523,800

## SCIENTISTS WHO SERVED ON S&E PEER PANELS FOR FY 1982

Scientists from government, universities, and industry served on the S&E peer panels this past year. Each panel was put together to fit the expertises needed for that specific granting area. The scientists involved are listed below by State and by institution or organization.

### ALABAMA

Charles R. Rossi  
Auburn University

Paul C. Smith  
Auburn University

Bryan Truelove  
Auburn University

Val T. Sapra  
Alabama A&M University

Gopal R. Sunki  
Alabama A&M University

Phillip C. Badger  
Tennessee Valley Authority

### ARIZONA

Darrel E. Goll  
University of Arizona

J. Mare  
University of Arizona

Charles F. Hutchinson  
Arizona State University

James L. Kuester  
Arizona State University

### ARIZONA--continued

E. Lamar Smith  
Arizona State University

### ARKANSAS

Billy R. Griffin  
P.O. Box 632, Prescott

### CALIFORNIA

R. A. Bankowski  
University of California-Davis

Wallis H. Clark, Jr.  
University of California-Davis

Sean Duffey  
University of California-Davis

D. E. Jasper  
University of California-Davis

Bryon Jenkins  
University of California-Davis

B. I. Osburn  
University of California-Davis

Donald A. Phillips  
University of California-Davis

### CALIFORNIA--continued

Calvin O. Qualset  
University of California-Davis

Robert B. Rucker  
University of California-Davis

Robert J. Shepherd  
University of California-Davis

Robert B. Goldberg  
University of California-Los Angeles

Marian E. Swendseid  
University of California-Los Angeles

Fred H. Mattson  
University of California-San Diego

Werner P. Heuschele  
Zoological Society-San Diego

### COLORADO

Ralph R. Baker  
Colorado State University

Kenneth G. Brengle  
Colorado State University

Frederick A. Murphy  
Colorado State University



COLORADO--continued

Steven Berg  
University of Denver

DELAWARE

J. K. Rosenberger  
University of Delaware

DISTRICT OF COLUMBIA

Richard G. Garner  
CSRS-USDA

George J. Mountney  
CSRS-USDA

Clyde R. Richards  
CSRS-USDA

Charles B. Rumburg  
CSRS-USDA

Earl J. Splitter  
CSRS-USDA

Howard S. Teague  
CSRS-USDA

Steve E. Zobriský  
CSRS-USDA

Thomas R. Murtishaw  
FSIS-USDA

FLORIDA

Jerry L. Stimac  
University of Florida

GEORGIA

Gordon Monroe  
University of Georgia

William J. Payne  
University of Georgia

Emmett B. Shotts, Jr.  
University of Georgia

Elaine B. Feldman  
Medical College of Georgia

IDAHO

Charles Peterson  
University of Idaho

ILLINOIS

Richard M. Forbes  
University of Illinois

Tuan-hau D. Ho  
University of Illinois

Donald Ort  
University of Illinois

M. Ristic  
University of Illinois

Robert Haselkorn  
University of Chicago

Marvin Bagby  
ARS-USDA  
Northern Research Center

Clifford Hesseltine  
ARS-USDA  
Northern Research Center

ILLINOIS--continued

Everett H. Pryde  
ARS-USDA  
Northern Regional Research Center

David H. Buck  
Illinois Natural Survey-Kinmundy

John Harkness  
Argonne National Laboratory

INDIANA

John R. Barrett  
Purdue University

Brian A. Larkins  
Purdue University

John Nye  
Purdue University

Robert Peart  
Purdue University

Marvin L. Swearingin  
Purdue University

IOWA

Edward L. Jeska  
Iowa State University

William W. Marion  
Iowa State University

W. P. Switzer  
Iowa State University

Billy L. Deyoe  
Iowa State University

IOWA--continued

Glynn Frank  
ARS-USDA  
National Animal Disease Center

W. L. Mengeling  
ARS-USDA  
National Animal Disease Center

H. W. Moon  
ARS-USDA  
National Animal Disease Center

KANSAS

Embert H. Coles  
Kansas State University

Stanley Clark  
Kansas State University

Robert G. Helgesen  
Kansas State University

KENTUCKY

J. T. Bryans  
University of Kentucky

Thomas P. Pirone  
University of Kentucky

LOUISIANA

C. Michael Smith  
Louisiana State University

Youn W. Han  
ARS-USDA  
Southern Research Laboratory

MAINE

Norman Smith  
University of Maine

MARYLAND

Jane F. Rissler  
University of Maryland

Landy Altman  
ARS-USDA-BARC

Thomas E. Devine  
ARS-USDA-BARC

D. K. Murrell  
ARS-USDA-BARC

Max A. Paape  
ARS-USDA-BARC

George Willson  
ARS-USDA-BARC

E. Gantt  
Radiation Biology Lab-Rockville

John Golbeck  
Martin Marietta Labs-Baltimore

MASSACHUSETTS

Frances S. Chew  
Tufts College

J. E. Erickson  
Tufts University

Shirley W. Thenen  
Harvard University

MASSACHUSETTS--continued

John Torrey  
Harvard University

MICHIGAN

Gerald T. Babcock  
Michigan State University

Frank B. Dazzo  
Michigan State University

James R. Miller  
Michigan State University

Albert Siegel  
Wayne State University

R. L. Witter  
ARS-USDA  
Regional Poultry Research Laboratory

MINNESOTA

William R. Bushnell  
University of Minnesota

Thomas J. Guilfoyle  
University of Minnesota

Gary H. Heichel  
University of Minnesota

La Vell M. Henderson  
University of Minnesota

J. A. Newman  
University of Minnesota

MISSOURI

Victor H. Dropkin  
University of Missouri

Dorothy Feir  
University of Missouri

J. R. Fischer  
University of Missouri

C. J. Nelson  
University of Missouri

Judy Davis Wall  
University of Missouri

Joseph E. Varner  
Washington University

Daniel T. Hopkins  
Ralston Purina Company

NEBRASKA

J. B. Campbell  
University of Nebraska

Raymond Chollet  
University of Nebraska

A. Torres-Medina  
University of Nebraska

J. J. Ford  
ARS-USDA  
Meat Animal Research Center

NEVADA

Richard E. Eckert  
ARS-USDA

NEW JERSEY

Leonard Mortenson  
Exxon Research & Engineering Co.

NEW MEXICO

John A. Ludwig  
New Mexico State University

NEW YORK

Robert R. Granados  
Cornell University

William Hansel  
Cornell University

R. H. Jacobson  
Cornell University

Andre T. Jagendorf  
Cornell University

H. F. Schryver  
Cornell University

B. C. Tennant  
Cornell University

Larry Walker  
Cornell University

Alexander J. Winter  
Cornell University

Selma E. Snyderman  
New York University

Jean Apgar  
U. S. Plant, Soil and Nutrition Lab

NORTH CAROLINA

E. V. DeBuysscher  
North Carolina State University

Gerald H. Elkan  
North Carolina State University

George G. Kennedy  
North Carolina State University

NORTH DAKOTA

Malcolm H. Smith  
North Dakota State University

OHIO

Daniel L. Jeffers  
Ohio State University

Gerald A. Peters  
Charles F. Kettering Research Lab

OREGON

James E. Lannan  
Oregon State University

Dallice Mills  
Oregon State University

PENNSYLVANIA

David E. Brune  
Pennsylvania State University

Walter Fiddler  
ARS-USDA  
Eastern Regional Research Center

William C. Lawrence  
University of Pennsylvania

SOUTH CAROLINA

Earlene A. Rupert  
Clemson University

Anthony H. C. Huang  
University of South Carolina

SOUTH DAKOTA

James L. Krysan  
ARS-USDA  
Insects Research Lab

TENNESSEE

Bobby L. Bledsoe  
University of Tennessee

James L. Wilson  
University of Tennessee

Conrad Chester  
Oak Ridge National Laboratory

TEXAS

Wayne LePori  
Texas A&M University

H. Renshaw  
Texas A&M University

TEXAS--continued

E. J. Soltes  
Texas A&M University

B. L. Allen  
Texas Tech University

UTAH

Anne Anderson  
Utah State University

E. Bruce Godfrey  
Utah State University

VIRGINIA

Judy A. Driskell  
Virginia Polytechnic Institute

Maureen R. Hanson  
University of Virginia

WASHINGTON

Donald Fisher  
Washington State University

Andris Kleinhofs  
Washington State University

WASHINGTON--continued

Travis McGuire  
Washington University

Clarence A. Ryan  
Washington State University

WEST VIRGINIA

E. Keith Inskeep  
West Virginia University

WISCONSIN

John Helgeson  
University of Wisconsin

Paul W. Ludden  
University of Wisconsin

John Zerbe  
Forest Service-USDA  
Forest Products Laboratory

WYOMING

James Smith  
University of Wyoming





